

JAPANESE HIGH TECHNOLOGY INDUSTRIAL POLICY  
IN COMPARATIVE CONTEXT

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Working Paper No. 1

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Working Paper Series

Center on Japanese Economy and Business  
Graduate School of Business  
Columbia University  
May 1986



The United States in the mid-1980s is engaging in an important, perhaps crucial, national debate on the goals, nature and effectiveness of governmental economic policy and its appropriate role in the American economy and society. As one significant element of this debate, much is being made of what is termed industrial policy. What "industrial policy" means depends upon the user; it ranges from being a euphemism for centralized government planning and intervention to a buzz word phrase referring to the more coherent application of policy tools already in use in the United States. Interest in industrial policy, however defined, has been heightened by perceptions of deep-seated difficulties in the American economy not treatable by traditional policy measures, by perceptions of Japanese industrial success and its competitive challenge to certain important American industries, and by perceptions of the success of Japanese industrial policy.

At the same time, debate is under way on United States trade policy, ranging from very narrow specific issues to the appropriate nature of the international economic system and the respective roles of the United States and Japan in it. The application of industrial policy by foreign nations, notably Japan, is perceived to provide competitive advantage to selected targeted industries, to the disadvantage of their American counterparts.

Thus, perceptions of Japanese industrial policy have entered the American debate on economic policy in two major ways: as a possible model to emulate in developing a United States industrial policy; and as a shaper of Japanese industrial structure and comparative advantage, especially vis à vis major American industries. It is not surprising that the main focus of American attention has been to understand how

Japan over time has successfully developed a number of major and now highly competitive industries (steel, motor vehicles, shipbuilding, consumer electronics) and to see an emerging competitive challenge in so-called high tech industries -- currently semiconductors, computers, robotics, telecommunication systems, optical fibers, new materials, solar batteries, industrial application of biotechnology, and the like. Less American attention has been given to Japanese policies for declining industries, and only limited attention to Japanese policies for defense industries.

This essay is divided into four parts. In the next section I briefly discuss and define the nature and scope of the concept of industrial policy in general and high tech industrial policy in particular. This is important because the term industrial policy has been defined and used in quite different ways within the United States, and Japan as well.

The main purpose of this chapter is to provide a general assessment of Japanese industrial policy -- its successes and its failures -- because that is an obvious requisite for those attempting to derive possible lessons and implications for United States policy. Simplistic and misleading myths and stereotypes abound regarding the Japanese economy and Japanese industrial policy, and we should beware of what may be incorrect "lessons." All too often perceptions of the Japanese economy are outdated, conditioned excessively by the earlier high growth era -- from the mid-1950s to the early '70s -- when Japanese industrial policy was in its heyday. Japanese industrial policy is discussed and evaluated in sections two and three.

In the final section I consider the relevance of the Japanese industrial policy experience for the United States, in its debates both on industrial policy and trade policy.

### §1. The Concepts of Industrial Policy and High Tech Industries

Every nation pursues policies that significantly affect both the aggregate productive capacity of the economy and its particular industrial structure. Some policies have these goals explicitly, others have indirect and at times unanticipated effects on the economic structure. Some policies are macro, others micro.

The term macro industrial policy has been used to describe policies, especially incentives to save, to invest, and to engage in R&D, that increase the productive capacity of the economy in the longer run while leaving it to the marketplace to allocate resources among specific industries. Macro industrial policy accordingly is focused on the supply side of the economy, in distinction from aggregate demand management which typically uses fiscal and monetary policy instruments. Macro industrial policies have long characterized Japanese economic policy in practice, though seldom described as such. A broad definition of macro industrial policy includes any macroeconomic policies to increase the quantity and especially the quality of the factors of production -- labor, capital, and natural resources -- and the general level of technology. This definition incorporates educational policy as an important element. It is noteworthy that Japan has an elementary and secondary school educational system which produces a substantially higher average level of literacy and of competence in natural sciences and mathematics than in the United States. It also has a college system, predominantly

private and of heterogeneous quality, that produces more engineers and especially electrical engineering college graduates than the United States, though fewer at the graduate level.

However, industrial policy more typically is defined in micro terms: identification of certain specific industries deemed to be of sufficient national importance as to merit and receive differentially favorable policy treatment in order that those industries have access to resources in degrees or timing different than would occur through the normal operations of the marketplace. A range of policy instruments can be used: direct subsidy payments, tax benefits, government-supported financing, protection from imports or promotion of exports, direct government purchases, funding of relevant R&D, special regulatory provisions, and so forth. The central point is the differential advantages government policy provides selected -- targeted, if you will -- industries to their benefit and to the relative disadvantage of all other industries. Those propounding industrial policy as so defined assert the marketplace is not operating optimally due to market imperfections or outright market failure, so that specific government intervention is warranted.

This definition of industrial policy, without reference to its basic objectives, to the policy environment, and to the utilization of specific policy instruments, is quite general. By this definition, the United States in fact pursues an industrial policy in the priority it gives to defense and aerospace industries, for example; and the continental Western European nations do so through regional development programs which in practice are keyed to certain basic industries such as steel. That is, simply referring to the "national importance" of an industry

while focusing on the resource reallocative results of government policy does not quite catch what the debate is mainly about, since the definition does not include the goals which give an industry national importance. (Unfortunately the goals are also often obscure in debate -- or patently self-serving.)

The United States International Trade Commission provides a precise but narrower definition in its recent study of Japanese industrial targeting. Equating industrial policy with "targeting," the report says: "International targeting is coordinated government actions that direct productive resources to give domestic producers in selected industries a competitive advantage" (ITC, 1983, p. 20). This definition has two important elements. It visualizes policy implementation in terms of a coherent package of specific policy instruments. And it makes the objective of industrial policy explicit: to increase the competitive advantage of selected industries vis à vis the rest of the world, that is, in a global market context. The industries selected provide tradable goods. There is an important normative implication some derive from this definition: it is natural and acceptable for a government to direct productive resources to military industries to achieve national security goals but it is not acceptable or fair for a government to interfere directly to create competitive advantage for selected civilian industries.

The national security dimension creates two conceptual problems. First, civilian-oriented and military-oriented high tech industries are highly intertwined, so it is at times difficult to separate long-run competitive marketplace and national security interests. Second, the definition and determination of national security, and the routes to its

achievement, are not unilinear or simple. Prevention of military attack is a central objective, but not the only one. Japanese thinkers and policymakers have stressed the importance of comprehensive security, which includes economic as well as military aspects. Its most important component is guaranteed access to supplies of essential inputs for maintenance of the national economy. The obvious inputs are industrial raw materials, exemplified by oil, and foodstuffs. Less obvious but in the long run probably equally important for any major advanced industrial nation is access to technological innovation and its fruits. Moreover, a country has to be able to pay for imports essential for national security: it has to produce goods demanded in world markets and it has to have access to those markets. To the extent this broader definition of national security is used (or invoked) then it is easier to argue that many high tech industries are strategic in a national security sense.

Moreover, one can argue that high tech industries are strategic in an economic sense for large, modern, high income nations seeking to expand economic power and well-being. In an excellent, comprehensive, comparative study, Nelson (1984) lays out this argument well. High tech industries are the leading industries in a Schumpeterian sense. Two rationales can be provided for government industrial policy in support of these industries: the product cycle implies eventual loss of specific competitive advantage, while R&D to gain advantage is not fully appropriable by those engaging in it; inter-industry externalities accrue to users of high tech products, and domestic users benefit earlier and more rapidly than foreign users.

High tech industrial policy focuses on the industries of the future, the winners, those where comparative advantage lies ahead. However,



there is another important strand in industrial policy, namely to "rationalize" or support major industries in cyclical or other temporary difficulty, or facing structural problems of declining competitiveness and comparative advantage in major product segments: helping the losers adjust to adversity, as it is sometimes crassly described. Any general evaluation of Japanese industrial policy must consider programs for industries in difficulty as well as those for important industries of the future.

What is meant by high tech industry? In some respects the definition is analogous to that of heavy industry: it is not very precise but everyone has some intuitive understanding, frequently in terms of specific industry examples. There is a broad consensus that certain industries are high tech -- semiconductors, computers, telecommunications, biotechnology -- but beyond these, and even as regards subindustries of these four, there is less agreement. In general "high tech industry" is a category which aggregates a number of specific industries with common characteristics -- much like such categories as heavy industry, basic industry, or consumer durables. Similarly, one can conceptualize high tech industrial policy as being at an intermediate level between macro-economic policy and (micro) industrial policy for specific, targeted industries.

The essential feature of a high tech industry is its great reliance on the application of new science-based technologies to products and/or production processes. Yet sophisticated technological innovation takes place in most industries; the Green Revolution in agriculture, and new fibers in textiles are examples in sectors generally deemed decidedly low tech. Thus, innovation per se, and even involvement with science, is not

a sufficient condition. The intensity of scientific and technology effort and the speed of innovation are important features of a high tech industry, involving the production of significant new knowledge from a strong science base; in other words, being at the global scientific and technological frontiers. Rather than a dichotomy between high technology and low technology industries, it is better to think of industries as spread over a continuum between these two extremes. The position of any given industry may shift along the spectrum as new scientific knowledge (often exogenously) emerges, or a given line of scientific inquiry and technological application significantly slows down. More important probably, completely new industries emerge at the high technology end of the spectrum as a consequence of science-based innovation and new demands for the products (Doane, 1984).

Quantitative indicators provide a useful, pragmatic approach to the problem of definition. A high tech industry is characterized by: a high ratio of scientists, engineers, and/or computer programmers in its work force; a high ratio of R&D expenditures to its sales; a high share of new products in its total sales. It is likely to have high actual and projected rates of growth of output and demand for its products. Capital intensity of production is not a particularly good indicator.

While new consumer products may be the consequence of high technology industrial development, implicit in much of the discussion of high tech industrial policy is the perceived strategic nature of the industry -- not only in military terms but as a basic capital or intermediate product which has diffused more widely throughout the economy. Thus, video cassette recorders and other consumer electronics, rather than being considered as high tech industries, are often seen as the

consequence of other high technology industries such as semiconductors. Personal computers are considered high technology because of their productive usage not the consumption pleasures they provide. The perceived linkages and externalities of almost an infrastructural nature are one reason why success in high tech industries is perceived as vital to the economic growth, well-being, and especially pre-eminence of a nation.

That an industry is high tech does not mean preferential treatment through industrial policy is required or necessary. The economic case for government support is the standard one of market imperfections or failure: high returns on average R&D activity combined with only partial appropriability by the doer; external benefits; high risk due to ignorance and uncertainty, often compounded by long lead times or the huge scale of required expenditures relative to firm size. However, the fact much private R&D has occurred and does occur without specific incentives does suggest many high tech industry activities would take place without special preferential treatment (industrial policy), and hence that such government programs create economic rents rather than incentives for additional activity. On the other hand, timing in the dynamics of high technology industrial development can be very important. In rapidly developing high technology industries being first or very close to first may provide significant learning and cost advantages over potential competitors. However, there are also cases in which the initial innovation has not succeeded in solving sufficiently the scientific, technological, production, or even marketing problems, and has lost out to closely pursuing followers.

Given the characteristics common to high tech industries and which distinguish them from other industries -- in degree rather than kind --

government policies to provide special benefit to high tech industries can derive either downward from macro policies or upward from specific industry policies, as is the case in Japan. In the United States, preferential treatment is intentionally provided high tech industries through macro policies which provide favorable tax treatment of R&D, rapid depreciation, and public training of engineers and scientists. These policies are premised on high tech industries being characterized by spending relatively more on R&D than other industries, buying or selling relatively more capital equipment, and employing relatively more holders of degrees in science and engineering.

The Japanese experience in industrial policy illustrates many of the conceptual and definitional issues of industrial policy. It is to that experience we now turn.

## §2. Japanese Industrial Policy

A careful, detailed examination of Japanese industrial policy as it has been applied in practice over the postwar period shows that it has often been ad hoc in nature, not always carefully thought out or focused, usually quite flexible in response to changing analyses and circumstances, and on occasion subject to considerable political pressures. In other words, like much of history it was complex and messy, rather than simple and clear-cut. Nonetheless, by virtue of hindsight we can abstract and generalize from the realities of the historical record in order to present general patterns and characteristics, without thereby claiming more for Japanese industrial policy than is warranted.

With these caveats in mind, Japanese industrial policy can be characterized as follows. Its goal has been to enhance economic growth

by anticipating dynamically efficient allocation of resources by the criterion of world not just domestic prices; to this end it has selected certain key industries as essential for preferential treatment; and it has provided such treatment through a comprehensive, coordinated package of policy instruments. Further, Japan has conducted its industrial policy in a generally conducive and supportive domestic policy environment, that is, there has been a consensus on what was being done, and general economic policies and conditions were conducive to success.

It is important to keep in mind that the goals, policy instruments, and policy environment have changed dramatically during the postwar period, and just what those changes have been. The postwar Japanese economy has gone through three phases: a decade of postwar reconstruction following the devastation of World War II; almost two decades, from the mid-1950s to 1973, of superfast GNP growth (about 10 percent annual average); and the most recent decade of 4 percent growth in a domestic and world environment of oil crises and stagflation. Industrial policy has evolved from one period to the next in response to these changing circumstances.

Well into the second phase, Japan was a low-income, developing country, and pursued trade and industrial policies like those of many other such follower countries. Industrial policy played an important role from the beginning, initially with a strong domestic market orientation; reconstruction was felt to require special government help for the fertilizer, electric power, coal, steel, and transport industries. To some extent this built upon government thinking and programs initiated in the 1930s and even earlier. As the Japanese high-growth era progressed industrial policy, and the intellectual rationalizations of it, reached

their heyday. New industries -- chemicals, petrochemicals, and other intermediate goods -- were added to the list for preferential support. These, like the other industries earlier, were regarded as high tech industries for Japan but were already well established in the United States.

Between 1955 and 1973 the Japanese GNP increased almost six times in real terms. By the early 1970s Japan had become the world's third largest industrial economy (following the United States and the USSR), with per capita incomes comparable to Western Europe. This profound surge of growth transformed the industrial structure and changed substantially the needs and conditions of industrial policy. Still, there were very few sectors in which Japan was pushing out the frontiers of knowledge. It was very successful learning and applying the best proven technologies, but with only incremental improvements. Even so, MITI was beginning to generate visions of "knowledge-intensive" (high tech) industries.

Japanese industrial policy as an ideal type came into its own in the high-growth era. It is useful to characterize it first in these ideal-type terms, next to indicate the changes that have taken place in industrial policy in the past decade, and then in the next section to provide an appraisal of the effectiveness and ineffectiveness of Japanese industrial policy in both its historical and present contexts.

#### Japanese Industrial Policy as an Ideal-Type

Ideal-types are a useful device for deriving general theoretical principles and patterns, even though they have been only imperfectly achieved in reality. The following depiction, by being formulated in idealized (one might say antiseptic) terms, provides a basis both to evaluate changes in Japanese actual high tech industrial policies and

practices over the past decade and to appraise its relevance for possible American industrial policy. A cautionary note is important: to describe the ideal-type means neither that it was the way industrial policy operated in practice nor that it had particularly effective results. Indeed, as is considered in the next section, I am skeptical of the claims put forth as to the great effectiveness of Japanese industrial policy.

Japanese industrial policy has been pragmatic and economic in its orientation. The basic goal has been to create the productive capacity for rapid growth by accelerating the transfer of resources to the major industries of the future, while smoothing the process of decline of uncompetitive industries, "picking winners and phasing out losers." In principle "winners" should meet the following criteria: industries of significant size in which Japan would have future comparative advantage as the relative supplies and costs of its factors of production changed with domestic growth and evolving international economic conditions, and as learning curve economies were achieved (infant industry cases); industries for which domestic and world demand would be highly income elastic; and industries in which Japan would become internationally price competitive. However, as is discussed below, only in the past decade has the general level of technology, human and physical capital, and economic production provided an adequate base for Japanese industry to move into high technology industries in any broad-based way.

The emphasis of Japanese industrial policy has been on economic growth and economically efficient resource allocation. Economic efficiency has come to be defined in terms of world markets, not (protected) domestic markets, and in terms of competitive prices, high quality, and

other non-price attributes. In contrast, a major goal of American industrial policy has been to maintain the industrial basis for military strength, in terms of quality and quantity but not of price. The contrast in policy goals between American military prowess (and the development of comparative advantage and export sales in military hardware) and Japanese economic and commercial strength is striking. The United States has also pursued policies to help specific industries, such as textiles, steel, and automobiles -- largely to "save" jobs -- but mainly by restriction of imports. Agriculture is one sector in which American industrial policy has been most successful. While there may be a major distinction in principle between the Japanese emphasis on efficient resource allocation and U.S. and Western European emphasis on the redistribution of income, the political economies in practice are not so different; Japanese policymakers have continuously provided support for inefficient but politically powerful farmers and small businesses on the grounds of more equal income distribution.

Japanese industrial policy has been designed, implemented, and justified by the Ministry of International Trade and Industry (MITI). MITI has been quick to argue market failure, so-called excessive competition, the need to catch up to best Western technologies and practices, and hence the need for government intervention. Its rationale (at times after the fact) for industrial policy has included the following themes. The private market mechanism inadequately allocates resources for long-run growth; MITI officials emphasize instances of market failure (external economies or diseconomies, public good effects, private underinvestment in R&D) and Japanese labor and capital market imperfections. One senior MITI official has argued that Japanese are so locked into their



own company (group) and are so competitive vis à vis others that they go beyond the bounds of normal economic behavior and engage in excessive competition -- with each other as much as with foreigners.

MITI officials apparently believe they can better anticipate the long-run strategic needs of the economy than the marketplace, which inevitably has too short a time horizon and is unwilling to assume enough risk quickly enough. They believe they can anticipate where the market will go, thereby speeding up its operation. The goal is to reach the same place as the market solution but more rapidly and (in the case of declining industries) at less social cost. While not so clearly stated, underlying the definition of future key industries is a strategic sense as to what industrial structure will be required for Japan to be a major economic power ten to twenty years in the future. Currently, this includes semiconductors, computers, telecommunications, nuclear energy, and other high tech industries. Since the late 1970s, MITI has placed greater emphasis on the other aspect of industrial policy, namely, assisting in the structural adjustment process of major uncompetitive, declining industries such as aluminum, petrochemicals, and textiles. The MITI rationale is pragmatic: in scaling down an industry it is more efficient to close the least efficient plants and achieve economies through (government-encouraged) merger than bankruptcy.

The Japanese implementation of industrial policy has several important elements. First, once an industry has been selected for support, MITI has put together (in negotiations with the Ministry of Finance) a comprehensive package of support: accelerated depreciation allowances, special R&D funding (often through the industry association) and tax benefits, loans through the Japan Development Bank or other government

financial institutions, and so forth. Second, the policy measures try to anticipate and to use the marketplace rather than replacing it, by providing various incentives to business to allocate resources as desired. Such a policy package, based on market incentives to encourage business behavior in desired directions, contrasts with the more piecemeal American approach of reliance on a single instrument in aiding specific industries without building in incentives to alter business behavior, as exemplified by de facto restrictions on imports of textiles, automobiles, or steel.

Third, MITI policy in principle has encouraged the combination of a competitive environment and of effective economies of plant scale in any chosen industry. Indeed, this was the real success of Japanese industrial policy in the high growth era of the 1950s and 1960s: rapid, efficient industrialization involving entry of new firms, which promoted competition in the domestic market. Non-Japanese firms were generally not allowed in during the early stages, but there was sufficient competition to make firms efficiency-oriented even as they profited from a protected market. Thus Japan, more rapidly than other nations industrializing behind import barriers, was able to achieve international competitiveness in a number of new important industries, ranging from consumer electronics to steel to small cars to certain types of semiconductors and computers. To be sure this was not neoclassical ideal-type perfect competition. Rather, it involved firms competing in dynamic oligopoly market structures. Consumers paid relatively high prices, especially in the early stages of an industry; but MITI-encouraged pressures to increase efficiency and productivity and to reduce costs so as to become

internationally competitive (typically with the threat of eventual loss of protection) eventually brought domestic prices down as well. However, there were important exceptions to this generally positive picture, notably petroleum refining, where optimum scale and low-cost production was not achieved.

Just how micro has Japanese industrial policy been? Let us consider three levels: an individual firm; an industry, narrowly or more broadly defined; and a productive sector, such as manufacturing, construction, agriculture, or services. Japanese industrial policy has been at the industry level, usually rather broadly defined. MITI has not chosen individual firms as national champions; it has not particularly favored one large firm over another; while it will help an industry in trouble, it usually will not help an individual firm in trouble of its own making. However, its policies have usually benefitted large firms relative to small. This seems to have been particularly the case with high tech industries in which only a few large firms have been able to participate in government-sponsored R&D projects, or those of the government-owned Nippon Telephone and Telegraph (NTT) monopoly. The robotics industry is one counter-example, but none of the early entrants were very large.

At the broad sectoral level the cumulative effect of both industrial policy and macro economic policy was to provide preferential access to resources to business, especially large firms, at the expense of housing, consumer credit, or social infrastructure. Agriculture, a lagging sector, also received special help. In the United States, in contrast, resources were preferentially allocated to defense, aerospace, and housing as well as agriculture (which is subsidized in all major advanced industrial nations). And within industry it may well be that the macro

system of tax and other incentives have affected specific industries in the United States even more differentially than in Japan; certainly the taxation of corporate profits varies more widely by industry in the United States.

The Japanese domestic policy environment has been quite favorable to industrial policy and to economic policy generally. High priority is still given in Japanese government policymaking to economic issues, domestic and international. However, changing economic and political circumstances (as is discussed below) has brought about major shifts in the relative importance of various objectives. The almost simple-minded focus in the 1950s and '60s on economic growth and efficient resource allocation through the private sector resulted in an unbalanced growth pattern with insufficient attention to environmental problems, housing, and social infrastructure. As is discussed below, by the early 1970s economic policy came to embody a broader mix of goals, including price stability and social welfare (mainly transfer payments for health and old age). Even so, the emphasis has persistently been on private enterprise and the operation (and influencing) of the market mechanism, with the first claim on scarce resources going to business not government.

Japanese are very competitive, and there are many areas and problems of conflict in Japan as in other societies. Japanese society is built on individual participation in groups -- the family, the school class, the work place -- and societal norms stress the importance of harmony through cooperation and at least formal consensus. This mutes and makes more subtle the normal conflicts of interest and adversarial relationships of life. Accordingly labor-management relations and government-business relations are considerably more cooperative and mutually beneficial than

in the adversarial, suspicious, more individualistic American society and its institutions; in Japan these relationships are seen as positive-sum, not zero-sum, games. Of course in a rapidly growing economy distributional issues were less salient and cooperation easier; it made more sense to focus on increasing the size of the pie than how to slice it up. And business in Japan has benefitted substantially from the continuance in power of the pro-business, conservative Liberal-Democratic Party (LDP) ever since 1955. It has also benefitted from an easier antitrust environment within which, with MITI approval, targeted industries could form temporary anti-recession cartels and high tech firms could participate in joint R&D projects (Yamamura, this volume). I consider the implications of different institutional arrangements in Japan and the United States in the final section.

#### Changes in Japanese Industrial Policy in the Past Decade

Over the past decade Japanese industrial policy has changed significantly as Japan has achieved affluence ("caught up with the West"), business has become strong and independent, growth has slowed greatly, the price of energy has risen dramatically, and Japan has adopted a free trade policy and greatly liberalized most of its imports. These have affected substantially the goals, policy instruments, and policy environment for industrial policy.

Two major trends are discernable in the recent evolution of Japanese industrial policy. Industrial policy has become less important in overall government economic policy, in terms both of the objectives and the instruments of industrial policy. And industrial policy has developed a tripartite focus: high tech industries, the winners of the

future; major, structurally depressed, industries in trouble; and energy and, to some degree, other natural resources.

First affluence, then much-slowed growth, have greatly altered the general policy environment for industrial policy. In the early 1970s the public debate on unbalanced growth resulted in increased priority for social infrastructure, pollution and other environmental control, social welfare (especially retirement and health benefits), and housing. Thus the share of general government expenditures in GNP has risen by more than 10 percentage points, to 33 percent by 1980. Moreover, business came to be seen, correctly, as strong and able to grow on its own; major industries no longer needed the special benefits of industrial protection. Moreover, with strength came greater desire by big business for independence from MITI and other government bureaucrats; business leaders do not want to be beholden to or dependent upon them, and are more resistant of their intrusion.

The two oil crises, much-slowed growth, and the rapid transition from a neoclassical to a Keynesian economy has probably had an even more profound effect. Until 1974 economic growth was fueled by high rates of business investment and high rates of saving; the operative constraint in other than brief cyclical downturn was supply capacity relative to burgeoning demand. Since 1974 the constraint on growth has been inadequate private and total domestic aggregate demand. Saving rates have declined somewhat but remained high; private business investment has slowed more rapidly, so that ex ante saving has been substantially greater than investment demand. Pump-priming through huge deficit-financed increases in government expenditures has covered part of the gap but not all. And the need for deficit-financing persisted in time and amount beyond the

political will to engage in it; by 1983 Japanese public sector debt, which had been negligible a decade earlier, was a larger percentage of GNP than in the United States.

This made the traditional emphasis of industrial policy on winners much less important. With the economy awash in surplus saving, most in financial assets, the problem was how to encourage businessmen, indeed anyone, to invest and spend rather than how to ration credit to them. With slow growth, income redistribution became more important than economic efficiency in the political economy of government policy. Government resources went increasingly to farmers, small business, and old people.

In the past several years the main focus of government policy has been on the macro problems associated with the huge central government budget deficits. The political decision has been to reduce the budget deficit even at the cost of slower growth (so much for the rapid growth policy of yesteryear); because it has been politically impossible to raise corporate or personal income tax rates, the main effort has been to hold the line or reduce expenditures. The narrowing of the deficit, from 6 percent to slightly under 4 percent of GNP, has been the consequence of the upward drift of tax revenues in GNP due to progressive tax rates and a leveling off of the rise in expenditures. In a related move Prime Minister Nakasone has given priority to broadly-defined "administrative reform," including deregulation of industry and finance, reduced budget subsidies to agriculture, and fundamental reorganization of certain public corporations, notably the deficit-ridden Japan National Railways which has been a major drain on the government budget. Big business has pushed hard for these reforms and other measures to hold down growth of

government expenditures, correctly perceiving that otherwise tax increases would fall heavily on business, at least directly.

One of the most important changes in the policy environment is that Japan is no longer insulated from the rest of the world. Foreign governmental pressures -- especially American -- have intruded on the cozy domestic arrangements that have been so much a part of Japanese industrial policy. Japan is now a major economy and world trader -- indeed, the challenger of American and European industrial might -- first in steel and cars and now semiconductors, computers, telecommunications and other high tech areas. Its actions, policy and otherwise, inevitably invite scrutiny and at times reactions by the United States and others. Japan has truly become an interdependent member of an interdependent world. As one of the three pillars of the liberal international economic order -- together with the United States and the Western European industrial democracies -- Japan can no longer use trade policy as an instrument of industrial policy; it must reduce trade barriers, not raise them.

The variety and power of policy instruments to implement industrial policy have been reduced substantially. Most importantly, in the present world environment and given Japan's commitment to the liberal trading system in principle, MITI is no longer able to impose foreign exchange or import restrictions -- tariffs, quotas, non-tariff barriers -- to help new potential winner industries. Import barriers for most high tech industries have now typically been reduced to minor levels. New industries and new products cannot benefit from newly imposed barriers. Japanese policy and behavior is rather closely monitored, especially by the United States, in order to press for further liberalization and to prevent new restrictions.



As Trezise (1983) points out, as a share of GNP, government resources going to business are not large relative to the United States and Western Europe; and most of those resources do not go to the three categories targeted by industrial policy -- high technology, declining industries, and energy. The largest proportion of government subsidies go to agriculture, then energy, small business, and the Japan National Railways. Government R&D expenditures are relatively low (Nelson 1984). About half go through the Ministry of Education for university science and technology support including faculty salaries and administrative costs. About a quarter is allocated to the Science and Technology Agency for essentially high tech purposes: space, ocean, and energy projects. About an eighth of government R&D expenditures come under MITI jurisdiction; more than half of that goes for energy. MITI's funds to support manufacturing R&D were on the order of a modest \$350 million in fiscal 1983 (Trezise 1983).

The government provides selective tax benefits, but they are widely dispersed; everyone gets something. The Ministry of Finance has calculated gross revenue losses in fiscal 1981 from all special tax measures were about 1,100 billion yen (about \$5 billion). Half was for exemptions on interest on deposits for small savers, another quarter was related to health and other social insurance. Somewhat more than \$1 billion went to business in accelerated depreciation, special reserve accounts and R&D tax credits. While the government loan program through its financial institutions is not inconsequential (though less than 10 percent of total loans), most now goes to small business. Export credits are for ships and plants -- standard big-ticket items. The Japan Development Bank, always viewed as a prime instrument of industrial policy, has lost its

focus and historic rationale. Energy is now the single largest category in its incremental loan portfolio, on the order of 40 percent (about \$2 billion in 1981). Only some 10 percent went to high tech industries other than energy.

MITI is losing its historic role as the predominant initiator, agent, and implementer of industrial policy. Many relevant issues of high tech (and other) industrial policy no longer fall pre-eminently in its manufacturing sector domain. The Science and Technology Agency and the Ministry of Education are in the high tech R&D act. This is not just in terms of budget resources, as the current inter-ministerial conflict on the appropriate law for copyrighting or patenting computer software exemplify. Telecommunications and NTT (Nippon Telephone and Telegraph) come under the Ministry of Posts and Telecommunications; it is initiating the new legislation on use of telecommunications lines for value-added-networks (VAN) linking computers and data banks. The Ministry of Welfare is responsible for standards and other procedures which continue to restrict imports of pharmaceuticals, medical equipment and the like.

For all these reasons, coherence in Japanese industrial policy has attenuated. However, one should not count industrial policy or MITI's role in it out, especially in the high technology arena. High tech industries have three major needs: assured markets; encouragement of R&D; and finance. Government procurement, including that of NTT and other public corporations, provides an immense market still substantially protected by a wide range of "buy Japanese" regulations and tax incentives. High tech R&D is encouraged through tax write-offs, government loans, subsidies, government industrial research labs (many under MITI jurisdiction), favorable antitrust provisions and government funding for

joint, cooperative, R&D projects among major corporations. Finance depends on industrial structure. Large firms moving into high tech activities can readily utilize internal funds and borrowing capacity. The major problem has been the provision of risk capital to new, small firms. Venture capital institutions are in their infancy, but that is now rapidly changing. Quite large amounts of Japanese and foreign venture capital funds apparently are becoming readily available; the problem is mainly to develop venture capital markets, and to create the environment where creative scientists and engineers (typically in large firms) are willing to leave secure positions and become entrepreneurs. These issues are elaborated upon with substantial industry-specific detail in the companion essays in this volume by Imai, Okimoto, Saxonhouse, and Yamamura.

While MITI's activist role in an industrial policy for high tech industry and energy has to be coordinated with a number of other ministries in addition to its traditional working relationship with the Ministry of Finance, it has continued to reign supreme in industrial policy for the structurally depressed manufacturing industries hit by high energy costs (aluminum, petrochemicals, etc.), low world demand (shipbuilding), or high labor costs (textiles, simple assembly operations). Of course, Japan's largest uncompetitive industry is agriculture, over which MITI has no jurisdiction. Considerable MITI effort since the late 1970s has gone into policies for losers, as reflected in the successful efforts to have the Structurally Depressed Industries Law passed in 1979 and revised and extended in 1983. This is a new thrust, and is dictated by the twin realities of great structural uncompetitiveness and slow domestic growth. While government industrial policy

earlier helped adjustment in coal mining and cotton textiles in the 1960s, labor transfer was achieved fairly smoothly because rapid growth created other job opportunities. Earlier structural adjustment programs were primarily bail-outs of the owners and their financiers. Even in the present slow job-opportunity growth environment that may well be the situation for more recent programs in structural adjustment as well.

### §3. Evaluation of Japanese Industrial Policy

In my judgment, industrial policy has been somewhat beneficial for the Japanese economy but its role and efficacy has been overrated by many. Japan has pursued a relatively coherent industrial policy, but its effect has not always been as intended, in degree or in direction. MITI has supported a number of specific industries and has had some notable successes. It has had some important failures -- even aside from the promotion of petrochemical, aluminum, and other energy intensive industries in the 1960s which were made uncompetitive by the sharp rises in energy prices in the 1970s. And there are a number of important industries, such as automobiles and consumer electronics -- indeed virtually all consumer goods -- in which the government did not take any differentially supportive role but which have succeeded on their own.

#### The Effectiveness Debate

There is no clear consensus among specialists on Japan's political economy regarding the effectiveness of Japanese industrial policy. Rather, there are honest differences of opinion among respected scholars. This is not the place to review that debate and its considerable literature in any detail, but its existence needs to be borne in mind. Broadly

speaking, there are two schools. By considering each in its stereotypic form, the nature of the debate is illuminated, even though most specialists place themselves somewhere between these two extremes.

One school sees Japan as embodying a state-guided capitalist system in which MITI and industrial policy have played a central role. In this view, government leadership has been the key to Japan's economic success, with business a willing follower. An extreme version of this approach is encapsulated in the phrase "Japan Inc.," which is, however, a red herring; all scholars agree it is too simplistic and naive a concept for what is a much more complex, variegated, multi-dimensional set of relationships among the triad of Liberal-Democratic Party politicians, central government bureaucrats, and big business leaders. Essentially, the responsibility for determining the goals of economic policy and seeing to it they are achieved is attributed to the bureaucracy: politicians reign, bureaucrats rule, business follows.

Chalmers Johnson has provided the most sophisticated argument for the efficacy and centrality of Japanese industrial policy, in his outstanding book MITI and the Japanese Miracle (1982) and other recent writings (1984) and speeches. But his, and this school's, main point is more fundamental: Japanese capitalism has a different structure from that of Western capitalism; there is a "Japanese system" of capitalism. In it the main role of the state is developmental; in the West it is regulatory. Johnson has well stated this position in a speech before the Japan Society (1983):

There are four fundamental structural features that exist in all the East Asian capitalist developmental states, including Japan. These are: (1) stable rule by a political-bureaucratic

elite that does not accede to political demands that would undermine economic growth; (2) cooperation between public and private sectors under the overall guidance of a pilot planning agency; (3) heavy and continuing investment in education for everyone, combined with policies to ensure the equitable distribution of the wealth created by high-speed growth; and (4) a government that understands the need to use and respect methods of intervention based on the price mechanism.

In this perspective, industrial policy is embedded in the system, and is a key feature of it. Data on the relatively modest level of government resources going to high tech (or other) industries do not adequately affect their initiating impact in this model of state-led, private sector-implemented capitalism because of systemic features and signaling effects to private industry and finance. These themes are also developed by Zysman and Cohen (1983) among others.

The other school denies the validity either of the state-leadership developmental model, or of an otherwise defined model specific to the Japanese economic system, or of the central and efficacious role of industrial policy in it. These themes have become intertwined in the debate, but conceptually one can disentangle them. One thus can hold that Japanese institutions and practices cumulate to define a distinctive Japanese economic system but in which industrial policy does not play a particularly central, effective, or coherent role. Alternatively, one might argue that specific institutional differences are not so fundamental that they comprise a distinctive system but that industrial policy is important and effective. Or, one can hold that while Japan has articulated and pursued an industrial policy and does indeed have certain

specific institutional features, neither are central to our understanding of the basic characteristics of the Japanese economy and its economic performance.

The second school sees the basic source of Japan's economic growth as being in a vigorous private sector which, taking advantage of the private market mechanism, has energetically, imaginatively and diligently engaged in productive business investment, commercially-oriented research and development, in the saving to finance those activities, and in the development of a supportive system of labor-management relations. Business entrepreneurs were and are the engine of growth. At the same time, the government is given credit for having pursued macro demand and industrial policies beneficial to private sector growth. The government helped contribute to a favorable economic environment -- as did the postwar international economic system -- but the major impetus to growth was from the private, market-oriented sector.

The most articulate proponent of this position is Philip Trezise, who has argued that Japan has an industrial policy but it is not particularly coherent, focused, or effective. An early statement appears in Asia's New Giant (Trezise 1976); recent statements include his testimony before the Joint Economic Committee (1983) and his essay in the Brookings Review (1983). Lincoln takes this position in an essay which, among other themes, is critical of the first school (1984). My own view (initially stated in Patrick and Rosovsky, 1976, ch. 1) is that industrial policy may well have helped the growth process to some degree, but it did not play a leading or central role.

The Japanese central government bureaucracy is certainly able and powerful; however, it is by no means monolithic. Japanese ministries are

more entrenched and autonomous than their counterparts in the United States. Each ministry has its own, at times self-serving, definition of the national interest. The Ministry of Finance, and certainly the Ministry of Agriculture, Forestry and Fisheries, perceive the national interest quite differently than MITI. MITI and the Fair Trade Commission take different positions on antitrust and industrial policy. Jurisdictional disputes and turf problems are as abundant in Japan as in other national bureaucracies. While MITI has jurisdiction regarding the domestic activities and foreign trade of most manufactures, other ministries have responsibility for certain important sectors: Ministry of Finance for all the financial institutions, Posts and Telecommunications for telecommunications, Welfare for medical equipment and pharmaceuticals, Agriculture for food processing, Transport for civil air transport, shipping, trucking and taxis, for example. MITI's industrial policy does not and cannot cover all industrial activities.

Government policies that encourage all industries, such as import protection in the 1950s and '60s, in effect protect none differentially. The main result is simply to give priority to business over households. This is important, because the essence of industrial policy is that it differentiates among industries by providing only certain industries specially large incentives. Recent research by Saxonhouse (1982, 1983, 1984) indicates that the differential impact among industries has probably been substantially less than earlier believed. This supports an earlier study by Pechman and Kaizuka (1976) on specific tax concessions granted to specific industries; they make the point that such concessions were so widespread, despite being specific to each industry, that the differential impact was relatively modest. Japanese industrial policy



may have started on a micro basis with specific priorities, and some certainly persisted; but the bandwagon effect became so widespread, especially in trade protection, but also in tax concessions, that its effect was akin to a macro industrial policy of helping virtually all industry.

If industrial policy is successful, one might expect an industrial structure quite different from what would result from the operation of purely market forces. A successfully anticipatory industrial policy might in the long run result in the same industrial structure, but at any point in time one would expect supported "winner" industries to be overrepresented and "loser" industries underrepresented. Yet this has not been the case. Japanese industrial structure has been and is very similar to other industrial nations when adjustments are made for market size, per capita income level, natural resource endowment, and distance from world markets (Saxonhouse, 1982, 1983, 1984, and his essay in this volume). This is not to say that past Japanese industrial policy has not had substantial effects. However, it does indicate the picture is more complex and less well understood than some would suggest.

The results of MITI's policies in targeting specific industries have been mixed in practice. One can credit the combination of MITI policy, market forces, and the mixture of Japanese business leadership and follow-the-leader business behavior for having created a generally highly competitive market environment in Japan. And there have been industries targeted successfully. However, industrial policy has not been successful in a number of major industries, with consequent high costs to consumers, savers, or taxpayers. The government in the 1950s and 1960s, through the Japan Development Bank, pumped immense amounts of low-cost

loans to marginal profitable ocean shipping firms, since private financial institutions refused to lend much. MITI has long targeted the commercial aircraft industry, with no commercial success. It could not prevent excessive domestic entrants into vehicle production for the domestic market, and later was unable to effect merger among competing smaller producers. The fundamental problems of the automobile industry have been masked in the 1980s by the so-called voluntary export restraints to the American market which in practice have significantly raised prices and profits on those sales for all Japanese producers. The greatest MITI failure, however, has been in the way it handled scale and entry in the petroleum refining industry. In order to reduce the large foreign share in Japanese oil refining, MITI promoted the entry -- under pressure from a number of business groups each of which wanted a piece of the action -- a large number of too small Japanese refining plants and companies with inadequate capacities to upgrade facilities to optimum scale. The successive oil crises and pressures for trade liberalization since 1973 have made clear the failure and high social cost of the MITI-generated structure of Japan's petroleum refining industry. These mistaken policies and problems have carried over into some petrochemical products as well.

The ultimate test of the success of Japanese industrial policy is whether it led to a significantly more rapid GNP growth rate than would have occurred otherwise. This is at the core of the scholarly debate. Japanese industrial policy in general seems to have anticipated where the market would have taken the industrial structure anyway, though with some major exceptions as first noted. MITI's role and contribution was to encourage certain industries, which were already growth industries, to

develop sooner than they might have otherwise. If so, such an industrial policy may have had some success in accelerating the growth rate. There are now a number of recent case studies which provided data and insights on the role and effectiveness of Japanese industrial policy in specific industries, including Okimoto, Sugano, and Weinstein (1984), Dore (1983), Borrus, Millstein, and Zysman (1983), Wheeler, Janow, and Pepper (1982), Magaziner and Hout (1980), and U.S. government publications (ITC 1983, GAO 1982a, GAO 1982b). The problem is that we do not yet have comprehensive, definitive studies which determine conclusively the degree and nature of the effectiveness of Japanese industrial policy, especially for Japan's overall growth performance.

#### New Policy Needs

Industrial policy in Japan today is in a fundamentally different position than it was some 10-15 years ago. Its goals are less clear-cut, more diffuse; there is a new focus on high technology industries, but the ability to identify and pick "winner" products and processes has decreased sharply; and the range and strength of policy instruments has diminished sharply. There have been a number of major forces, but two in particular, at work to bring about this sharply changed environment for high technology industrial policy. First, from about the mid-1970s, depending on the industry, Japan has reached the technology frontier in most civilian goods sectors; it no longer is a follower nation. Having caught up, Japan no longer has the American model of evolving industrial structure. While very specific technologies may be identifiable, "winners" are no longer so obvious; it is considerably more difficult for MITI bureaucrats to pick them. Second, until the early 1970s, protection from imports was used as a major policy instrument to support Japanese

manufacturers. Japan, as a major leader in the international economic system, can no longer utilize trade barriers very effectively to assist high technology industries.

Nonetheless, we should not underestimate the Japanese government's ability to implement a high technology industrial policy, and in ways consonant with present GATT rules. The focus of Japanese government attention on high tech industries is a recent phenomenon. Most importantly, it is a natural consequence of the long-run process of industrialization. Only after Japan had achieved a high level of technological sophistication, capital stock, human skills -- "caught up with the West" in the slogan of the 1970s -- was it a natural step to move into high tech industries. And this has been predominantly a private sector phenomenon, as firms have developed new products and what are now categorized as entirely new industries. As Dore (1983) has perceptively discussed, in the latter half of the 1970s a consensus began to emerge in Japan which visualized Japan as a producer as well as consumer of technology. This was due in part to the worldwide tendency to attach greater importance to technological innovation, in part to greater self-confidence within the business, government and academic technology elite within Japan. The enunciated rationale for government involvement is textbook: very large scale projects, high uncertainty, long lead times, thereby high risk, and social need.

Given a different set of industries, new needs, and the new international environment, the mix of instruments for high tech industrial policy is almost necessarily different from that of one or two decades earlier. Standard protectionist trade policy instruments -- tariffs or import quotas -- are no longer a feasible way to help high tech

industries; U.S. and other foreign governmental pressures are too strong. Those pressures are not limited to trade; equal access to Japanese markets for foreign-owned firms operating in Japan is of comparable importance, as reflected in emphasis on the rule of equal national treatment. Nonetheless, Japanese high tech firms continue to have preferential access to Japanese government procurement. This is enhanced in high tech industries by close linkages between R&D prototype developmental activities and subsequent equipment purchases, especially in (though not limited to) NTT and telecommunications.

Other essays in this volume provide considerable information on and analysis of Japanese high tech industrial policy, ranging from specific industry studies to overall assessments. Inevitably and desirably, government support to R&D receives major attention, in part because it is the main instrument MITI uses to encourage research in the development of a wide range of fairly specific products. At issue are both the institutional arrangements, notably joint research by major companies typically under government auspices, and government funding of R&D.

Of MITI's 1983 R&D expenditure budget of 2,244 million yen (\$955 million), 45 percent was for energy, 28 percent for infrastructure consolidation (including certain MITI labs and the patent system), and 18 percent for high tech projects (Dore, 1983, Table 2). These are relatively modest amounts of resources spread over a number of projects. Most projects, however, involve substantially larger multi-year commitments. Dore (1983) concludes, in his case study of the twelve projects of the ten-year "next generation base technologies program" begun in 1981 (and comprising only 3 percent of MITI's 1983 R&D budget) that almost all the projects were selected well prior to the commercialization stage, by

reasonable criteria, through consultation of young MITI officials with industry and to some extent academic specialists. He argues that the generation of economic rents (that is, the financing of projects private firms would do anyway) is limited because the funding is for contract research with patents going to the government; and that the receipt of contracts strengthened the position of industry researchers in their respective firms, perhaps inducing thereby a larger commitment of firm resources.

### Declining Industries

While much attention has been directed to Japanese industrial policy for high tech industries, easing the structural adjustment of declining industries may become as important a component of overall Japanese industrial policy as efforts to pick winners. As Japan's comparative advantage continues to evolve -- due to the continuing spread of the industrial revolution to the developing nations, to Japan's own future growth pattern, and to changing world relative prices of energy and other commodities and products -- structural adjustment problems will become more severe in Japan, as they have in all advanced industrial nations. While MITI helped the adjustment process in coal mining and cotton textiles in the late 1950s and early '60s, most of its experience in declining industry programs is very recent, indeed underway at present.

It is more difficult to persuade firms to contract than to expand -- to scrap equipment, reduce capacity, rationalize, merge, change business or go out of business. The policy mix is likely to be different too: more direct subsidies, greater reliance on low interest rate loans, virtually forced closing of plants and even merger of firms. The record of industrial policy to date in helping declining industries is mixed.

The policy package in the early 1980s for shipbuilding was apparently effective; capacity was reduced by one-third without major bankruptcies (Uriu, 1984). However, capacity adjustment and reorganization has been slower in aluminum, petrochemicals, electric furnace steel, and other depressed industries. Aluminum production has dropped precipitously, from a capacity of 1.6 million tons to production of 300,000 tons (Samuels, 1983). MITI policy simply has not been able to keep up with the dictates of the marketplace, given very high Japanese electricity costs and MITI's inability to halt the surge of imports since 1979.

It is unclear whether industrial policy for declining industries has resulted in a more efficient restructuring of firms and industries, or at less social cost, than simply allowing the marketplace to work. Indeed it is unclear whether MITI policy has anticipated, or simply followed, the adjustment process forced by market conditions. However, viewing the choice as simply that of adjustment via the free market or via MITI is politically naive. These are powerful industries, with large debts to powerful banks. It may well be that the Japanese government, for the same domestic political reasons as in the United States and all industrial democracies, has to take some kind of ameliorative action. The MITI programs of structural adjustment of declining industries may not be optimal, but they certainly are preferable to such ad hoc measures as direct government subsidies or new protectionist barriers against competitive imports.

There is a certain irony that many structurally depressed industries in present day Japan are those which two decades earlier were targeted as "winners" or at least as basic industries. Part is because MITI officials, like private and public policymakers everywhere, did not

anticipate the energy crisis and fivefold rise in relative prices of energy in the 1970s. However part is the consequence of earlier errors in selecting targets; it is unlikely that dynamic comparative advantage would change so rapidly as to shift an industry from winner to loser category in only two decades.

#### §4. Implications for the United States

What is the relevance of Japanese industrial policy for American economic policy? There are implications for two major policy areas: U.S. trade policy and U.S. industrial policy. In each there are four policy options: to take no specific action; to seek Japanese reform; to emulate; to counteract its effects on comparable U.S. industries.

Japanese industrial targeting has come to figure prominently in the current American debate on trade policy, being labeled by some as an unfair trade practice injurious to the American industry whose Japanese counterpart is receiving special Japanese government support. U.S. trade law permits countervailing action where Japanese and other imports are either subsidized or dumped and thereby cause injury to the domestic industry, or where the amount and rate of growth of imports is so large as to be the main cause of injury to the domestic industry. U.S. multi-lateral and bilateral trade negotiations with Japan also aim to eliminate Japanese import restrictions which protect targeted Japanese industries from competition from the United States in the Japanese market. On the whole, the implications of Japanese targeting for export competitiveness to the American market has generated more vociferous concern, though some have voiced concern over limited access to specific Japanese markets as a



consequence of industrial targeting even though the particular instruments do not fall within the normal trade policy domain.

An extreme view is that Japanese industrial targeting is per se an unfair trade practice because it confers unfair degrees of competitiveness on Japanese firms. Under existing American and GATT law only current government subsidies are regarded as an unfair practice. Japanese exports essentially are not subsidized at all, so this offers no remedy for American import-competing industries. The injury test under Section 301 is sufficiently strong that few American industries have been able to avail themselves of it.

The basic problem is what has been termed original sin: the specific industry exporting to the United States no longer receives targeted Japanese government support, but it did earlier in its development. Thereby, industrial policy is unfair because of the future advantages it creates for export competitiveness. To counteract these effects of (Japanese) industrial policy, various legislation has been introduced before Congress -- reciprocity bills, bills to strengthen Section 301, and bills to strengthen dumping and countervailing duty laws (Suomela, 1983). In general the main intent and impact of these legislative proposals is, under the guise of "unfairness," to raise protectionist barriers against imports. Implicitly or explicitly the legislation is particularly aimed at imports from Japan.

Governmental support of major industries in almost all industrial nations has been almost inevitable. On the one hand, new high technology industries -- such as aircraft, computers and semiconductors in the United States -- received their initial impetus and support from government because of their military-strategic significance. On the other

hand, as is stressed by Murakami and Yamamura in this volume, in the long-run process of the international spread of the industrial revolution virtually every country has been a follower in most industries and accordingly has provided its industrial infants protection of one sort or another.

There are two difficulties with the original sin position. First, since almost all major industries in all countries received some special government support at some stage of their development, they are all guilty of original sin. If the United States were to apply the original sin argument to Japanese industrial policy, Japan could make a similar case against American industries. This is particularly the situation of high tech industries, where government-funded R&D and procurement has been so important (Nelson 1984 and Eads and Nelson in this volume).

Second and relatedly, application of the original sin argument by the United States against Japan opens a Pandora's box with profound implications for the functioning and even the structure of the international economic system. It would provide a rationale for Western European nations to restrict many American exports, for the United States to restrict imports from many newly industrializing, developing economies -- indeed for virtually every country to restrict imports from every other. Perhaps an international agreement could be negotiated through GATT to set a statute of limitations on original sin, but that seems unrealistic and unlikely.

In sum, the policy approach of trying to counteract the perceived effects of Japanese industrial policy by new trade-restrictive countervailing measures is not in American national interest. It is

protectionist; and it potentially could seriously damage the international economic system.

Reform of current Japanese industrial policy may be a more sensible and viable American trade policy objective. It is unrealistic to expect Japan to eschew completely industrial policy in any of its three target areas: high technology, energy, and structurally depressed industries. Indeed, in a rather unthought-out, decentralized, non-packaged way the United States pursues (industrial) policies to help firms in the same three areas. The reality is that all advanced industrial nations -- Japan, the United States, Western Europe -- pursue high tech industrial policies, through R&D support, government procurement, regulatory mechanisms, and outright subsidies. Each government tries to succor its own, even within a market context.

The aim of U.S. efforts to reform Japanese industrial policy is, and should be, to achieve free trade flows, equal market access, and equal national treatment for competitive American firms in Japan -- in both high tech and declining industries. Beyond that, national policies supporting the development of high tech industries, the presumed future winners, does not contravene the rules of the international economic system -- so long as support is not explicitly anti-trade. The problem of course is that all targeted support is implicitly biased against imports or for exports in the favored industry, and conversely in those industries not receiving such special benefits. Favored industries benefit; those not favored are hurt; the macro implications are not clear. Given the close intertwining of military and economic strategic objectives in government high tech policies, it is unlikely that a better set of international trade rules can be devised and adopted.

Proponents of an American industrial policy à la Japan seem to intend more of an emulation of perceived Japanese success than a fight-fire-with-fire approach counteracting a Japanese industrial policy which may not be desirable but is inevitable. Such an American industrial policy involves far more than a few selected institutional changes such as easing of the antitrust enforcement provisions and environment for corporate joint research activities (Baxter, 1983). As the earlier discussion of the concept of industrial policy indicates, an American industrial policy would provide preferential support to selected civilian industries through a comprehensive package of policy instruments in order to enhance their market competitiveness. On the whole the "lessons" of Japanese industrial policy for any such American industrial policy should be cautionary.

First, American policymakers should beware of facile generalizations and stereotypes about the nature and effectiveness of Japanese industrial policy, and on the whole should be skeptical of that experience. The evidence is still far from complete. There were many factors at play bringing about Japan's two decades of superfast growth up to 1973 and its still-good economic performance of the past decade relative to the United States and Western Europe. In my judgment industry-specific industrial policy has had a moderately useful, but not the central, role in Japan's economic success; it has made less of a policy contribution than macro industrial policy or aggregate demand policy.

Second, it is even less clear whether Japanese-style industrial policy in its historical or especially in its current manifestations is appropriate for the United States. In what ways and to what extent can an industrial policy system be incorporated into the ideology of American

economic policy and help achieve its basic goals, and fit into the existing panoply of policy instruments, institutional arrangements, and governmental administrative structure? The answers are not at all clear.

Third, what I have termed macro industrial policy has made a significant contribution to Japanese growth: general tax incentives to business to invest productively and to engage in R&D, and to households to save; and the development of a highly effective public education system. Macro industrial policy, like industry-specific, can and should rely on the marketplace. Thus, the risks, costs, and inability to appropriate fully the benefits of R&D mean government funding of R&D can be desirable, in both Japan and the United States. One important historical reason for Japanese industrial policy was the shortage of capital and an inadequate financial institution framework for allocating capital well. The United States has very well developed financial markets, and so has less need of industrial policy. On the other hand, in certain respects Japanese labor markets and institutions work better than their American counterparts, notably in on-the-job training and maintenance of high rates of employment. Certainly any American industrial policy should take into account manpower needs and conditions, but in a macro rather than a micro context.

Fourth, it is easier for a nation to pick potential future winner industries when it is in a follower position. It can study the industrial structure of more advanced nations to learn its potential future competitiveness. However, the United States is at the technological frontiers; no other countries provide a model of future industrial structure to emulate. It is very unlikely that American government bureaucrats, scholars, or other experts can judge better than the

marketplace what the specific products and industries of the future will be. More general policies -- support of basic R&D, improvement of the educational system, general incentives for investment and saving -- will be more effective in enhancing sustained economic growth than special governmental support of specific new industries.

Fifth, recent Japanese and American experience suggest that once a country is at the technological frontiers, import restrictions may not be an efficient instrument of industrial policy either for high tech industries or for solving the structural problems of mature industries in trouble. Moreover, protectionism is not an appropriate policy for advanced industrial nations; it is destructive of the generally beneficial international economic system so carefully crafted and nourished since 1945. As the preceding discussion and the other essays in this volume indicate, Japan does have a high tech industrial policy, or at least a set of policy instruments used to promote the growth of high tech industries. However, the resources allocated are modest and their effectiveness not yet clear. The focus nonetheless is on civilian-goods industries and on cost competitiveness. U.S. high tech industries also have flourished and benefitted from much the same set of government incentives as their Japanese counterparts. However, military-strategic needs have been at the forefront, with only partial spillover to civilian production.

Sixth, perhaps the most important lessons from Japanese industrial policy are how to deal most effectively with important industries in trouble and needing structural adjustments. The realities of the political economy of any democratic industrial nation, including the United States and Japan, is that the political and social costs of adjustment in

major industries are too great to allow a government to rely solely and simply upon the market mechanism. Whether consumers and taxpayers and economists like it or not, the government is likely to take some steps to help American textiles and steel and automobiles, and indeed has done so. American policy solutions have tended to be ad hoc, and import restrictive. They have not really provided incentives for management and labor to bring about the changes needed in those industries if they are to be efficient, cost and price competitive. Japanese industrial policy for structurally depressed industries may provide a better second-best solution than the second-best solutions the United States has been using thus far. This is probably where the best case can be made for an American industrial policy: to have a coherent, efficient program of adjustment for major industries in difficulty. The postwar evidence is they will receive help anyway, mainly in the form of protection from imports, through the operation of interest group politics in the American political system.

Seventh, if the United States should decide to employ industrial policy to achieve important economic objectives, it can learn from the Japanese methods of implementation. Policy should be long-run in focus, consistent and pro-market (competition-promoting) in approach, and mobilize a package of mutually supportive policy instruments. The criterion of effectiveness should be economic efficiency, as measured by cost and price competitiveness in world, not just United States, markets. And, since the benefits of industrial policy in the first instance accrue to the owners, managers, and workers of those industries targeted for preferential treatment while the costs are borne by taxpayers or consum-

ers, then the beneficiaries should be required to meet performance goals in order to justify the support received.

Finally, one can regard Japanese industrial policy as reflective and symbolic of a whole host of specific institutional differences between the Japanese and American capitalist systems. This raises a far broader, more speculative, and more important set of issues worthy of a separate study. Are the systems fundamentally different? If so, what needs to be done about it? These are both empirical and conceptual questions, which require an agreed definition not only of the essence of capitalism but on its acceptable or unacceptable institutional forms. In my view, Japanese capitalism is not fundamentally different from Western capitalism, though it is more akin to continental European than Anglo-American cases. All capitalist economies share fundamental similarities. U.S.-Japan binational comparisons of specific institutional arrangements have the danger that it is not clear which country is far out on the spectrum. On this matter, all nationalities tend to be xenophobic (or history-culture bound): their own institutions, despite all their imperfections, are regarded as the norm -- if not better than those anywhere else.

But suppose Japanese capitalism is fundamentally different. What are the policy options for the United States? One option is to adopt the Japanese system more or less in toto. Hardly anyone seriously considers that as desirable, much less feasible. A second option is to demand that Japan change its system so that it becomes just like that of the United States (the proposal of Secretary of Commerce Baldrige). This is equally infeasible -- and probably equally undesirable. A third option is to exclude Japan from the international economic system by establishing special rules (local context, reciprocity, etc.) for economic



transactions with Japan. This is a perverse and dangerous approach: Japan is simply too large and it could result in the dangerous formation of discriminatory regional blocs. It would simply be an excuse for American protectionism. Rather, the issue is how better to integrate the Japanese economy into the world economic system.

The last option -- I feel the only real option -- is to have a general mechanism of adjustment that takes into account differences among economies in institutions and in industrial and other economic policies as well as in factor endowments. The world does have such a mechanism: the multilateral exchange rate system. The flexible exchange rate system makes it possible for economies to adjust to institutional as well as other changes at home or abroad. With this option working, the others are not necessary. The essential feature is not whether exchange rates are fixed or fluctuating, but whether the system is truly open, multilateral, freely operating, and based on the free flows of goods, services, and capital. In either system, or variants thereof, a country has to shape domestic macroeconomic policies -- on both the supply and demand side -- in light of the realities of economic interdependence as reflected in balance of payments and exchange rate relationships. In macro-systemic terms the case has yet to be made that it matters economically whether one country pursues an industrial policy or not.

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